

What is claimed is:

[Claim 1] 1. An x-ray detector comprising:

an x-ray detection layer configured to output electrical signals in response to reception of x-rays;

a circuit board having a plurality of electronic components disposed thereon and configured to at least control readout of the electrical signals from the x-ray detection layer; and

a cover assembly enclosing the x-ray detection layer and the circuit board, the cover assembly formed of a first material and incorporating impact-absorbing material different from the first material.

[Claim 2] 2. The x-ray detector of claim 1 wherein the cover assembly includes a handle to support portability thereof.

[Claim 3] 3. The x-ray detector of claim 1 further comprising one or more bumpers formed of the impact-absorbing material, the one or more bumpers secured to an external perimeter of the cover assembly.

[Claim 4] 4. The x-ray detector of claim 3 wherein the cover assembly includes four corners, and having a bumper formed of impact-absorbing material overlapping each corner of the cover assembly.

[Claim 5] 5. The x-ray detector of claim 1 wherein the cover assembly includes an insert of impact-absorbing material disposed at a pre-determined impact zone.

[Claim 6] 6. The x-ray detector of claim 5 wherein the pre-determined impact zone includes a corner of the cover assembly.

[Claim 7] 7. The x-ray detector of claim 1 wherein the impact-absorbing material is a viscoelastic material.

[Claim 8] 8. The x-ray detector of claim 7 wherein the viscoelastic material includes foam.

[Claim 9] 9. The x-ray detector of claim 1 wherein the x-ray detection layer includes a scintillator layer and a photosensitive layer configured to detect illumination of the scintillator layer.

[Claim 10] 10. The x-ray detector of claim 9 further comprising a glass substrate having transistors etched thereon and configured to control operation of the photosensitive layer between a data acquisition state and a readout state.

[Claim 11] 11. The x-ray detector of claim 1 configured as a flat-panel, solid state x-ray detector.

[Claim 12] 12. A solid state x-ray detector comprising:

a scintillator layer configured to output light in response to x-ray exposure;

an array of photosensitive detector elements supported by a glass substrate and configured to store electrical charge as a function of light output by the scintillator layer during data acquisition and output electrical signals indicative of the stored electrical charge during readout;

a housing enclosing the scintillator layer, the array of photosensitive detector elements, and the glass substrate; and

viscoelastic material secured to the housing.

[Claim 13] 13. The solid state x-ray detector of claim 12 wherein the housing includes one or more cavities, each cavity having an insert of viscoelastic material disposed therein.

[Claim 14] 14. The solid state x-ray detector of claim 13 wherein the housing includes an insert of viscoelastic material positioned at each corner thereof.

[Claim 15] 15. The solid state x-ray detector of claim 12 further comprising a layer of viscoelastic material sandwiched between the scintillator layer and an undersurface of the housing.

[Claim 16] 16. The solid state x-ray detector of claim 12 wherein the viscoelastic material is formed of a material sufficient to prevent fracturing of at least one of the scintillator layer, the array of photosensitive detector elements, and the glass substrate when dropped a distance of 20 cm.

[Claim 17] 17. The solid state x-ray detector of claim 12 further comprising a handle incorporated into the housing to support portability thereof.

[Claim 18] 18. The solid state x-ray detector of claim 12 wherein the viscoelastic material includes foam.

[Claim 19] 19. The solid state x-ray detector of claim 12 further comprising an insert of viscoelastic material at one or more corners of the housing.

[Claim 20] 20. A cover assembly to encase components of an x-ray detector, the cover assembly comprising:

a top support panel and a bottom support panel collectively defining an internal volume configured and sized to house components of an x-ray detector;

at least one cavity formed in at least one of the top support panel and the bottom support panel; and

impact-absorbing material disposed in the at least one cavity, the impact-absorbing material different from that which the top support panel and the bottom support panel are formed.

[Claim 21] 21. The cover assembly of claim 20 further comprising a cavity formed in each corner of the at least one of the top support panel and the bottom support panel.

[Claim 22] 22. The cover assembly of claim 20 wherein the impact-absorbing material includes viscoelastic material.

[Claim 23] 23. The cover assembly of claim 22 wherein the viscoelastic material includes foam.

[Claim 24] 24. The cover assembly of claim 20 further comprising a handle defined in the top support panel and the bottom support panel.

[Claim 25] 25. The cover assembly of claim 20 wherein the top support panel and the bottom support panel are comprised of carbon graphite.

[Claim 26] 26. The cover assembly of claim 20 configured to prevent fracturing of a glass substrate housed in the internal volume when subjected to a point-load of 370 pounds.